REMARKS/ARGUMENTS

Reconsideration and continued examination of the above-identified application are respectfully requested. Claims 1 - 3, 7 - 13, 15 - 19, 21 - 27, and 30 - 53 are pending in the application. Claims 4, 5, 6, 14, 20, 28, and 29 are currently canceled. Claims 30 - 53 are presently withdrawn from consideration. No amendments have been made.

On June 10, 2009, Mr. Hoch, an attorney with Kilyk & Bowersox, contacted Examiner Alexander, the Examiner indicated that the reference to the Okado reference in the present Office Action is in error and is no longer being relied upon in any rejection.

Mr. Hoch also indicated to the Examiner that the previous §102 rejections were not maintained, but now the Examiner is newly asserting a §103 rejection. The Examiner indicated that it would be acceptable for the applicants to request that the next Office Action be made non-final if the §103 rejection is maintained. This request is being respectfully made at this time.

Previous rejection of claims 21-23 and 25-26 under 35 U.S.C. §112, second paragraph, for indefiniteness

In the previous Office Action dated April 17, 2008, claims 21-23 and 25-26 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. However, in the present Office Action, this rejection was not presented and, therefore, it appears that the Examiner has withdrawn this rejection. But, it is not entirely clear since, at page 5 of the present Office Action in the "Response to Arguments" section, the Examiner appears to assert that applicant's arguments are not convincing. The problem or confusion with these remarks in the present Office Action is the following. In the present Office Action, the Examiner now rejects claims 21-23 and 25-26 under 35 U.S.C. §112, first paragraph, for failure to comply with the

written description requirement, wherein in the previous Office Action, these same claims were rejected under 35 U.S.C. §112, second paragraph, for indefiniteness. Thus, the Examiner's comments are not understood. To avoid any assertion by the U.S. Patent and Trademark Office that applicants have not fully responded, the applicants incorporate in their entirety the comments made in the previous Amendment filed December 12, 2008 with regard to the previous rejection under 35 U.S.C. §112, second paragraph. The Examiner's brief comments at page 5 of the Office Action do not fully address the detailed arguments made by applicants in the previous response, and the applicants believe that in view of the information provided in the previous response, the claims clearly are definite to one skilled in the art. Furthermore, this is supported as well by the Declaration of Sheldon Davis, which is filed with this response.

Accordingly, the claims are definite under 35 U.S.C. §112, second paragraph.

Rejection of claims 21-23 and 25-26 under 35 U.S.C. §112, second paragraph

At page 2 of the present Office Action, the Examiner now rejects claims 21-23 and 25-26 under 35 U.S.C. §112, first paragraph, based on the written description requirement. The Examiner asserts that the original specification does not describe the new amendments made to claims 21, 25, and 26. This rejection is respectfully traversed.

As pointed out in the Amendment filed December 12, 2008, at page 12, in particular, the Amendment to claim 21 finds full support in paragraphs [0046], [0047], [0062], [0065], [0067], and [0074]. To further assist the Examiner, paragraphs [0046] and [0047] are reproduced below.

> **[0046] Interfacial potential by oil absorption.** A common type of QA/QC test for the structure of particulate materials such as carbon black is to add a liquid slowly to a mass of material as it is being stirred. As the ratio of the volume of liquid to the mass of particulate material increases, the torque required to mix

changes. Typically, the ratio of the volume of liquid added to the mass of material at the maximum torque is reported as a QA/QC test for structure. Another QA/QC test is to report the same ratio at a predetermined fraction of the maximum torque. A preferred liquid is dibutyl phthalate (DBP), and the reported value is often referred to as the DBP number. Paraffin oil has also been used. These volumes to mass ratios are strong functions of the morphology of the particulate material.

[0047] However, the flow of a particulate material wetted by a liquid also depends on the interfacial potential through the relative strengths of particle-particle interactions and particle-liquid interactions. When an absorptometer test is repeated with a second liquid on the same particulate material, the relation between torque and volume of liquid added changes. For example, maximum torque may be different for the same particulate material in different liquids, or, alternatively, the volume of liquid added to reach the maximum torque may be different. These differences reflect the interfacial potential of the particulate materials. Therefore combinations of oil absorption tests with different liquids can be used as QA/QC tests for interfacial potential of a particulate material.

These paragraphs specifically describe the use of an absorptometer to test the particulate material using a first liquid ("a liquid") and a second liquid ("second liquid") and measuring maximum torque or volume of liquid added. This language is specifically found in the paragraphs above and in paragraph [0047] in particular, and also as shown in the Examples.

With regard to claim 25, the previous response indicated that support for the amendment can be found, for instance, in paragraph [0049]. Paragraph [0049] is reproduced below:

[0049] Interfacial potential by rheological tests. The degree of flocculation of a particulate material in a liquid depends on the balance between the particle-particle interactions and the particle-liquid interactions. In other words, the degree of flocculation depends on the interfacial potential of the particulate material. One measure of this balance is the degree of shear thinning - the drop in

> viscosity with an increase in shear rate. Another measure of the degree of flocculation is the Bingham yield point. Yet another measure of the degree of flocculation, is the elastic modulus at low strains. Each of these methods can be used for determining the interfacial potential of the particulate material.

This paragraph specifically states that the degree of flocculation can be measured for the particulate material.

With regard to claim 26, in the previous response, paragraph [0043] was referenced for support. Paragraph [0043] is reproduced below:

> **[0043] Interfacial potential by gas adsorption techniques.** Some of the methods described above for determining surface area from the adsorption of gases, e.g., BET analysis, fit the data with two parameters - one for the surface area and one for the solid-gas interaction. The parameter for the solid-gas interaction is a measure of interfacial potential. Therefore from the same data that is used to report surface area by BET analysis, information about the interfacial potential is available. Therefore, a method which involves measuring the adsorption of gases other than nitrogen or krypton, which are common "inert" gases used for BET analysis, can be used for determining interfacial potential. Examples of alternative gases which can be used for measuring interfacial potential include water, ammonia, and various organic vapors such as toluene, ethanol, and the like. A preferred gas adsorption technique and data analysis to obtain interfacial potentials is to measure the spreading pressure, which is described in more detail below.

Paragraph [0043] specifically refers to determining interfacial potential by gas adsorption techniques and specifically refers to measuring the absorption of gases other than nitrogen or krypton and specifically identifies the gases as gases from water, ammonia, toluene, or ethanol.

Thus, the Examiner's comments that support cannot be found in the present application is not correct and, in fact, word-for-word support can generally be found in these paragraphs for the

amendments set forth in the previous response. Accordingly, these amendments to claims 21, 25, and 26 are supported by the present application and therefore satisfy 35 U.S.C. §112, first paragraph.

Thus, this rejection should be withdrawn.

Rejection of claims 1-3, 7-13, 15-19 and 21-27 under 35 U.S.C. §103 over Barthel et al. (U.S. Patent No. 6,800,413) or Wideman et al. (U.S. Patent No. 6,348,539)

At page 2 of the most recent Office Action, claims 1-3, 7-13, 15-19 and 21-27 were rejected under 35 U.S.C. §103 as being obvious over Barthel et al. (U.S. Patent No. 6,800,413) or Wideman et al. (U.S. Patent No. 6,348,539). The Examiner asserts that Barthel et al. shows a method of preparing carbon black and silica at the specific BET – method surface area (DIN 66131 and 66132) where these characteristics are determined by gas adsorption or inverse gas chromatography. The Examiner further stated that Barthel et al. has been read on the claimed combination of "morphological values" and "interfacial potential properties." The Examiner also states that Wideman et al. teaches a method of making a composition comprising carbon black, silica and metal oxide particles in specific size ranges, and torque and BET values monitored to determine the desired characteristics of the composition and have been read on the claimed combination of "morphological values" and "interfacial potential properties." This rejection is respectfully traversed.

To further support the comments made in the previous response and the present response, attached with this Amendment is a Declaration submitted under 37 C.F.R. §1.132 by Dr. Sheldon Davis, an employee of the assignee. This Declaration fully supports the positions taken by the applicants, and Dr. Davis would be considered one knowledgeable in the art. In view of the Declaration submitted with this response, the arguments set forth in the previous response and

the comments set forth below make it clear that the cited references do not teach or suggest the claimed invention and the rejection should be withdrawn.

The present invention is directed to resolving a problem associated with particulate material production in which materials that are seemingly made "within "spec" with respect to one or more measures of morphology, such as particles size, surface area, structure, porosity, etc., nonetheless do not perform consistently as expected in applications. As such, the "within spec" assessment of a particulate material from a morphological standpoint can represent a "false positive" to some extent. Until now, the industry was not entirely clear why the product would not perform consistently even though the particulate material was within morphological specifications. Efforts to determine the source of such problems only after they emerge in products incorporating the particulate material are inefficient and often both time consuming and expensive. Trial-and-error approaches comparing the effects of adjustments made in the particulate manufacturing process with differences observed in the ultimate product containing the particulate material may resolve the product level problem within a limited context. However, such an approach does not provide a mechanism for intercepting problems at the particulate production level before problems arise in end products that incorporate the particulate material. The present investigators appreciated that the problem of particulate materials that are "within spec," but perform inconsistently in application, ideally would be addressed as part of a quality control (QC) and/or quality assurance (QA) program implemented at the particulate production level, *before* end-products become involved. Moreover, the present investigators have developed a solution to the problem in this regard, which is reflected in their present claims. The present invention not only provides quality control and/or quality assurance for the particulate material but may also make it easier for a customer to obtain consistency in their end products

and any intermediate products containing the particulate material, such as polymer products, elastomeric products, inks, coatings, toners, and the like.

Wideman et al. measures surface area of silica using a conventional BET method as only a morphological property measurement (col. 4, lines 41-48). Torque is measured by Wideman et al. on *a compounded rubber sample* (col. 8, line 55 to col. 9, line 4) and not a particulate material itself as recited in claim 1. Thus, in at least the latter respect concerning torque measurements, Wideman et al. differs from the present claims for similar reasons as the Reszler reference, which had been previously applied against the claims by the Examiner before being withdrawn in the Examiner's previous Office Action (and after the applicants' submission of an Appeal Brief on January 16, 2008). Therefore, Wideman et al. does not teach or suggest any of the present claims.

With respect to the Examiner's comments, at page 5 of the present Office Action, that the remarks are not commensurate in scope with the pending claims because the specific limitations of paragraph [0043] are presently not claimed, and even if these limitations were claimed, the Examiner would not alter this position, the applicants respond by stating that, first, the claims clearly recite the determination of at least one interfacial potential value, and this can be done based on various methods, one of which can be the test described in paragraph [0043]. Barthel et al. does not use this test or the methods set forth in the claims to make any measurement or understanding of an interfacial property value and especially does not use any of this data to provide a method to determine product consistency as set forth in claim 1 of the present application. The Examiner appears to take the position that if the same word is found in the reference, this is sufficient for maintaining the rejection when, in fact, the reference as a whole must be considered and, further, the use of the particular measurement in the cited reference

must be taken into consideration. Claim 1 of the present application does not merely recite measuring a BET value. The applicants have gone to great effort to assist the Examiner in explaining the particular measurements in claim 1 and have made repeated efforts to reference the paragraphs in the present application to ensure that the Examiner has a complete understanding of the test methods and the invention. The attached Declaration by Dr. Davis further should assist the Examiner in this understanding and the differences between the present invention and the cited references.

As stated, Barthel et al. only relates to determining surface area by BET analysis according to standard methods DIN 66131 and 66132 (see col. 2, lines 53-55; col. 9, lines 30-34; col. 10, lines 16-26, 34-36, 45-48; col. 14, lines 22-24). As well known in the industry, measurement of gas adsorption by these DIN standards 66131 and 66132 involves measuring the adsorption of nitrogen or krypton as an "inert gas." This provides only a measurement of surface area. These standards used for BET analysis do not provide a measurement of interfacial potential, such as explained in paragraph [0043] of the present application. Barthel et al. does not teach or suggest how a standard BET analysis according to DIN 66131 and 66132 may be modified to provide a measure of interfacial potential as recited in the present claims.

Also, Barthel et al. and Wideman et al. do not teach or suggest that interfacial potential of carbon black or silica is a results-effective parameter. The Examiner still has not identified in the Office Action where any one of these references teach or suggest that measurement or its significance and utility. As the PTO specifically instructs in M.P.E.P. §2144.05 under the heading "Only Result-Effective Variables Can Be Optimized":

> A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA

1977) ...

The Examiner's reasons for this rejection repeatedly refer to morphological properties taught in the two relied upon references, which are different from an interfacial property as explained in the present application. Therefore, the Examiner's reliance on the In re Boesch case is still not on point.

As described above and in the present application, "at least one morphological value" and "at least one interfacial potential property value" as defined are different from each other. Wideman et al. and Barthel et al. do not appreciate the importance of maintaining at least one interfacial potential property value of a filler within a target range, in addition to maintaining at least morphological value of the filler within a target range. In particular, Wideman et al. and Barthel et al. do not teach, suggest or predict success of the present method including the recited step of maintaining at least one interfacial potential property value of a particulate material that is carbon black or silica, comprising i) determining at least one interfacial property value of the particulate material; and ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the interfacial potential property value within the second target range. Further, present claim 1 recites that this method is applied to particulate material that is carbon black or silica.

As demonstrated in the working examples of the present application, morphological values can appear to indicate that a particulate material is within spec, while the added interfacial potential property measurements reveal that the particulates perform inconsistently. As discussed previously herein (and in the present application), implementation of quality control at the filled product (compounded rubber) level, such as in Wideman et al., overlooks the potential serious problem of particulates made "within spec" which nonetheless perform inconsistently in

applications. However, the method of the present invention provides product consistency by maintaining both at least one morphological value as well as at least one interfacial potential property value of the particulate material that is carbon black or silica. In this way, it has unexpectedly been found that product quality assurance (QA) and quality control (QC) are vastly improved if, along with measurements of morphology, measurements of values that reflect the interfacial potential of the particulate material are also made.

As also explained above, Wideman et al. measures surface area of silica using a conventional BET method as a morphological property measurement and torque is measured on *a compounded rubber sample,* and not a particulate material *per se* as recited in claim 1. As also indicated, Barthel et al. does not teach or suggest how the standard BET analysis according to DIN 66131 and 66132, used only to measure surface area as a morphological property, may be modified to provide a measure of interfacial potential as defined in the present application.

Further, claim 24 recites a wicking rate method used as a measure of the interfacial potential of the particulate material that is carbon black or silica, wherein the interfacial potential property value is determined by a wicking rate method *comprising determining a difference in wicking rate for two or more liquids into equivalent packed columns of the particulate material* itself. Example 4 (paras. [0069]-[0070]) in the present application illustrates this embodiment.

The Examiner has admitted that Barthel et al. and Wideman et al. are silent as to adjusting the process variable to achieve the desired characteristics of the particles and the specific testing by "wicking rate." Without citing any evidence, the Examiner refers to "notoriously well known" testing of the speed or distance that a particulate solution "wicks" (e.g., as allegedly used for paper chromatography), and apparently equates such testing with the wicking method recited in present claim 24. However, any measurement of wicks in paper

chromatography does not correspond to measurement of interfacial potential by wicking rates such as described in paragraph [0048] of the present application, which is reflected in claim 24. This is also confirmed by the Declaration of Dr. Davis. Thus, the Examiner's assumption that any "notoriously well known" prior measurement of "wicks" is the same method as presently claimed is factually incorrect as can be seen by comparing the wicking rate test of the present invention with paper chromatography. How can paper chromatography be used to test the wicking rate of particulate material itself? Further, the Examiner has not set forth an apparent reason why one of ordinary skill in the art would have considered modifying any alleged "notoriously well known" wicking tests to duplicate the wicking rate method recited in present claim 24 used to determine an interfacial potential of carbon black or silica.

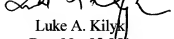
Therefore, this rejection should be withdrawn.

CONCLUSION

In view of the foregoing remarks, the applicant respectfully requests the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,



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